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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/691,685

10/23/2003

Chi-Yang Lin

3304.2.96

6603

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7590

09/20/2006

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EXAMINER

SINGH, DALIP K

ART UNIT

PAPER NUMBER

2628

DATE MAILED: 09/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/691,685	<b>Applicant(s)</b> LIN ET AL.	
	<b>Examiner</b> Dalip K. Singh	<b>Art Unit</b> 2628	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE \_\_\_\_\_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 June 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Remarks*

1. This Office Action is in response to applicant's remarks dated June 9, 2006 in response to PTO Office Action dated March 9, 2006.
2. Applicant's arguments with respect to the rejection(s) of claim(s) 8 under 35 U.S.C. § 112 have been fully considered and are found to be persuasive. Therefore, the rejection has been withdrawn.
3. Applicant's arguments with respect to the rejection(s) of claims(s) 1-17 under 35 U. S.C. 103(a) have been fully considered and they are not persuasive.
4. With respect to applicant's argument with respect to claims 1-17 that "On the contrary, according to Ben-Yoseph et al, whether the CPU can help **DOES NOT** depend upon on the utilization rate of the CPU, but instead depends on the burden of the multimedia processor. Under this circumstance, it does not matter whether the CPU utilization rate is detected on not. In other words, there is no motivation to combine Ben-Yoseph et al. with Plante et al.", applicant's attention is drawn to the fact that Examiner very specifically stated that Ben-Yoseph et al. is indeed missing this teaching. Ben-Yoseph et al. has the host processor 102 and multimedia processor 106 operate in concert to balance the execution load between the host processor 102 and multimedia processor 106 (col. 7, lines 20-35). Plante et al. **discloses** calculating CPU utilization rate for the purpose of CPU performance level assessment. Therefore having established Ben-Yoseph is concerned with improving graphics performance and Plante adaptively throttling a computer, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify Ben-Yoseph with the teachings of Plante et al. **because** this would result in increased system performance.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,949,439 to Ben-Yoseph et al. in view of US 2002/0194509 A1 to Plante et al.

a. Regarding claim 1, Ben-Yoseph et al. **discloses** a multimedia processor 106 (graphics process of the instant claim) interfacing to a host processor 102 (central processing unit of the instant claims) in a multimedia computer system 100 to supply functionality including digital video encoding, decoding and playback acceleration (col. 3, lines 10-55). Further, the host processor 102 and multimedia processor 106 operate in concert to balance the execution load between the host processor 102 and the multimedia processor 106. Generally, all possible instruction execution is directed to the multimedia processor 106, freeing the host processor 102 from extensive computations. However, if the multimedia processor 106 gets overloaded, the resource manager 308 shifts graphics operations to the DIB engine driver on the host processor 102, reducing the load during such operations (col. 7, lines 20-35). However, Ben-Yoseph et al. **does not disclose** detection of a utilization rate of said central processing unit (host computer 102) and allocation of said graphics data to either central processing unit or said transformation/lighting engine of said graphics processor according to said utilization rate of said central processing unit. Plante et al. **discloses** calculating CPU utilization when the CPU has no other executable tasks to perform and then depending

on the CPU utilization, the CPU performance level is increased, decreased, or remains the same (paragraph 5: ...In one aspect of the invention, CPU utilization is calculated when the CPU has no other executable tasks to perform. Then, depending on the CPU utilization, the CPU performance is increased, decreased, or remains the same...).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the resource manager of Ben-Yoseph with the feature “monitoring CPU utilization rate and based on utilization rate, engaging CPU to modify its performance” as taught by Plante et al. **because** this would increase system performance.

b. Regarding claim 2, Ben-Yoseph et al. **discloses** two-dimensional graphics operations include solid fill, pattern fill, color expansion, polygon draw operations and the like (col. 6, lines 1-17) and the multimedia processor 106 operates under control of a real-time multitasking kernel (col. 3, lines 40-42).

c. Regarding claim 3, Ben-Yoseph et al. **does not disclose** step of detecting said utilization rate of said central processing unit is performed by periodically sampling command flows of said central processing unit. Plante et al. **discloses** CPU utilization monitor 320 is configured to calculate utilization statistics and send the statistics to CPU throttler 313; queries the operating system for user time and kernel time; uses combination of tallying, querying to determine idleness and utilization (paragraph 43, 44 and 45). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device as taught by Ben-Yoseph et al. with the feature “tallying and querying to determine idleness and utilization” as taught by Plante et al. **because** it provides for CPU to be made available to engage in graphics data processing as well thus improving system performance.



- d. Regarding claim 4, Ben-Yoseph et al. **does not disclose** allocation of said graphics data to said transformation/lighting engine of said graphics processor when said utilization rate of said central processing unit is equal to greater than a threshold value; and allocating said graphics data to said central processing unit when said utilization rate of said central processing unit is less than said threshold value. Plante et al. **discloses** calculating utilization and comparing it with a threshold and setting a flag (promotion flag); and if utilization is less than a threshold, another flag being set (demotion flag) (paragraph 66). Therefore, it would have been obvious to a person of ordinary skill in the art at the time invention was made to modify the device as taught by Ben-Yoseph et al. with the feature “allocation of graphics data to graphics processor or central processing unit based on a threshold” as taught by Plante et al. **because** it improves system performance.
- e. Regarding claim 5, Ben-Yoseph et al. **discloses** multimedia processor 106 interfaces to a host processor 102 in a **multimedia computer system 100** (col. 3, lines 10-20).
- f. Regarding claim 6, it is similar in scope to claim 4 above and is rejected under the same rationale.
- g. Regarding claim 7, it is similar in scope to claim 2 above and is rejected under the same rationale.
- h. Regarding claim 8, Ben-Yoseph et al. **does not disclose** wherein said first threshold value is identical to said second threshold value. Plante et al. **discloses** wherein at block 705, promotion/demotion calculations are performed to determine whether the CPU performance level should increase, decrease, or stay the same; if utilization exceeds a threshold, promotion flag is set; if less than a threshold, demotion flag is set (paragraph 66). Therefore, it would have been obvious to a person of ordinary

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skill in the art at time invention was made modify the device as taught by Ben-Yoseph et al. with the feature “CPU performance tuned to the utilization threshold” as taught by Plante et al. **because** this prevents CPU performance level going in oscillation i.e.; avoid hysteresis (paragraph 89).

i. Regarding claim 9, it is similar in scope to claim 3 above and is rejected under the same rationale.

j. Regarding claim 10, it is similar in scope to claim 5 above and is rejected under the same rationale.

k. Regarding claim 11, it is similar in scope to claim 1 limitations above; and a path selection unit (resource manager 308) shifts graphics operations (col. 7, lines 20-35); and is rejected under the same rationale.

l. Regarding claim 12, it is similar in scope to claim 3 above and is rejected under the same rationale.

m. Regarding claim 13, it is similar in scope to claim 4 above and is rejected under the same rationale.

n. Regarding claim 17, it is similar in scope to claim 7 above and is rejected under the same rationale.

7. Claims 14, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,949,439 to Ben-Yoseph et al. in view of US 2002/0194509 A1 to Plante et al. as applied to claim 1 above, and further in view of US 6,549,961 B1 to Kloth.

a. Regarding claims 14 and 15, Ben-Joseph-Plante combination **is silent about** path selection unit being incorporated in a north bridge chip; being implemented by hardware. Kloth **discloses** a crossbar switch which routes access requests from processors 22 to requested resources 28 and that crossbar switch 80 may be built into bridge 24 or may be a stand alone component of multiprocessor system 20

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(...Multiprocessor system 20 may include crossbar switch 80 to route access requests from processors 22 to requested resources 28...col. 4, lines 34-44). Therefore, it would have been obvious to person of ordinary skill in the art at the time invention was made to modify the device as taught by Ben-Joseph-Plante combination with the feature “cross bar switch functioning as a path selection unit implemented in bridge chip” as taught by Kloth (col. 4, lines 34-44) **because** it provides an integrated and reliable solution for system level design.

b. Regarding claim 16, Ben-Joseph provides for resource manager 308 similar to the path selection unit per instant claim limitation being implemented in a multiple-level software architecture 300 executing in the host processor 102 (col. 6, lines 53-62).

### ***Conclusion***

8. Applicant's arguments presented are not persuasive. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Dalip K. Singh** whose telephone number is **(571) 272-7792**. The examiner can normally be reached on Mon-Friday (10:30AM-6: 30PM).




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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Ulka Chauhan**, can be reached at **(571) 272-7782**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, please contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). Please note that the new Central Official FAX number for application specific communications with the USPTO is **571-273-8300** (effective July 15, 2005).

Dalip K. Singh  
Examiner , Art Unit 2628

dks  
September 2, 2006

  
ULKA CHAUHAN  
SUPERVISORY PATENT EXAMINER